



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,940	06/08/2004	Jui-Meng Jao	NAUP0480USA	3939
27765	7590	03/22/2005	EXAMINER	
NORTH AMERICA INTERNATIONAL PATENT OFFICE (NAIPC)				ANYA, IGWE U
P.O. BOX 506				ART UNIT
MERRIFIELD, VA 22116				PAPER NUMBER
				2891

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/709,940	JAO ET AL.
	Examiner	Art Unit
	Igwe U. Anya	2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 04 January 2005.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-18 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 08 June 2004 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4 – 11, 13 – 18 are rejected under 35 U.S.C. 102(b) as being

anticipated by Applicant's admitted prior art (AAPA).

3. AAPA (fig. 4) teach a method of forming a solder bump on a substrate, comprising:

forming a substrate having a first area (12) and a second area (14) on the center and border of the substrate, respectively (paragraph 5);

forming a conductive layer (16) on a surface of the substrate (fig. 4);

performing a CVD process to form dielectric layers (18, 26) on the substrate to completely cover the conductive layer (paragraphs 6, 7);

forming at least one via plug (22) in portions of the dielectric layer within the first area down to a surface of the conductive layer;

forming at least one metal pad (24) electrically connected to the via plug;

forming an UBM layer (28) on the dielectric layer (26) to cover the metal pad;

forming a solder bump (30) on the UBM layer;

wherein the dielectric layer comprises a passivation layer (26) atop a dielectric layer (18);

wherein the via plug comprises either one of titanium (Ti), titanium nitride (TiN), tungsten (W), aluminum (Al), copper (Cu) or copper-aluminum alloy (paragraph 6); wherein the UBM layer is formed by sputtering process (paragraph 7); wherein the substrate is a semiconductor wafer with circuits formed inside the semiconductor wafer (paragraph 5); and wherein the solder bump formed within the second area is employed as a dummy solder bump to improve the fluidity of an underfill liquid compound in subsequent packaging processes (paragraph 7).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 3, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view Owada et al. (US Patent 5220199).
7. AAPA teaches the features previously outlined, but lacks the dielectric layer and the passivation layer comprising either silicon nitride or silicon oxide.
8. However, Owada et al. teach a dielectric layer and a passivation layer comprising of silicon nitride or silicon oxide (col. 7 line 26) in reducing parasitic capacitance in dummy solder bump structure (col. 5 lines 44 – 49).
9. Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Owada et al. into the AAPA as art recognized equivalents. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a dielectric suitable for analog capacitance.
10. Prior art made of record and not relied upon, considered pertinent to applicant's disclosure include Yamasaki et al. (USPAB 2004/0183187).

Remarks

11. Applicant's arguments filed on January 4, 2005 have been fully considered but they are not persuasive. The dummy bump electrode (30) and the conductive layer (16) are in capacitive relationship, thereby not in contact. Applicant's invention has less structure (absence of element 24 of area 14 in fig. 4). Fig. 4 discloses the invention as claimed. The fact that prior art discloses the additional structure is irrelevant since the limitation (absence of element 24 of area 14 in fig. 4) is not claimed. Furthermore to be given weight in structural limitations in a method claim, the structural limitation must affect the method in a manipulative sense. Ex parte Pfeiffer, 1962 C.D. 408 (1961).

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

12. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Igwe U. Anya whose telephone number is (571) 272-1887. The examiner can normally be reached on M - F 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William B. Baumeister can be reached on (571) 272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2829

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Igwe U. Anya
Examiner
Art Unit 2829

IA

March 17, 2005



W. DAVID COLEMAN
PRIMARY EXAMINER